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OPERATION
OF
VESICO-VAGINAL FISTULE

WITHOUT

THE AID OF ASSISTANTS;

WITH

A VIEW OF THE RELATIVE MERITS OF THE CLAMP, INTERRUPTED
SILVER, AND BUTTON SUTURES.

BY

NATHAN BOZEMAN, M. D.,
NEW YORK.

(Being remarks, in substance, made before the New-York Medical Journal Association,
November 20th, extracted from the New-York Medical Journal for February.)

18603

NEW YORK:
D. APPLETON & COMPANY,
90, 92 & 94 GRAND STREET.
1869.

Bob

53 WEST 33D STREET, NEW YORK,

Feb. 25, 1869.

Sir:

I beg leave to say that I have recently opened a Private Institution for the treatment of the Surgical Diseases of Women, and being somewhat dependent upon members of the profession for encouragement in the enterprise, I would respectfully ask the favor of such patients of this class as cannot be satisfactorily treated at their homes.

For further information apply to or address,

Your obedient servant,

NATHAN BOZEMAN, M.D.

To

Dr.

With the author's compliments

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OPERATION
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VESICO-VAGINAL FISTULE.

Remarks on the Advantages of a Supporting and Confining Apparatus, and a Self-retaining Speculum in the Operation of Vesico-vaginal Fistule; Models of Certain Forms of Suture; their Results practically contrasted in the same Cases and upon the same Fistulous Openings.

SUPPORTING AND CONFINING APPARATUS.

I WOULD remark that I have had this apparatus constructed specially to receive and support the patient in an odd position for the operation of vesico-vaginal fistule, which I denominate the *right-angle position, upon the knees and chest*. This position was first proposed by Prof. Roux, nearly forty years ago, and was adopted soon afterward by Prof. Wutzer, in Bonn. But, as employed by these surgeons, two of the most important advantages of it were not appreciated: first, freedom of the abdomen from pressure; and second,

effectiveness with which the patient could be secured without the aid of assistants.

In our construction of the apparatus here presented we claim to have secured the above important advantages, and to have utilized the position for all operations upon the anterior wall of the vagina, and, we may add, operations generally about the anus and rectum of both sexes.

Having previously described and pointed out the many advantages of this contrivance before another society in the city, it is not necessary that I should do so again on this occasion. Suffice it to say, in its use three principal objects are sought to be attained :

1. Extension of the vertebral column and relaxation of the abdominal muscles essential to free gravitation forward of the pelvic and abdominal viscera.
2. Support and mechanical confinement of the patient by controlling muscular action at certain points without encumbering the abdomen, or interfering with the functions of respiration and circulation.
3. The safe administration of anaesthetics.

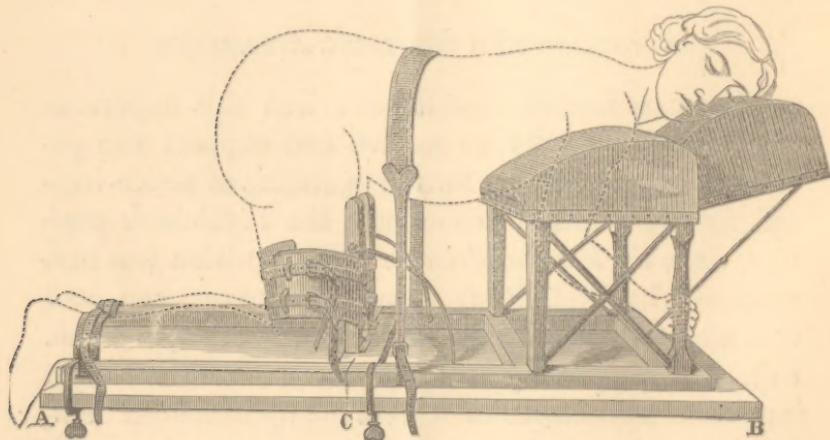


FIG. 1.

As may be seen, the apparatus is admirably adapted to all of these purposes. It is forty-four inches in length and eighteen in width. The construction, as seen, is simple and strong. It is light, weighing only seventeen pounds, and very portable when folded up. It may be placed for use upon any kind of table, to which it is made fast by the weight of the patient and a couple of small clamps.

Fig. 1 is an illustration of the apparatus in use. The whole figure is here exposed, in order that the relationship of every part of the apparatus to the body may be seen. In actual use, we would observe, there is little or no exposure of the person, the patient being placed in position, and secured as here shown, under a sheet. In fact, there is less exposure in this position than any of the others usually employed, for the reason that the patient is so steadily and securely held that her clothing does not become disarranged, as ordinarily results from her resistance and struggle under the pain of the operation.

The apparatus, as may be seen, is placed upon and secured to the table, A B. The patient first kneels upon a couple of cushions, the thighs being perpendicular to the table and received against the two upright splints, held in position by the corresponding braces. Around each thigh and splint is placed a pad, over which are buckled two strong straps to secure the whole. In a similar manner the ankles are confined. The lower limbs thus arranged and secured, muscular action is effectually controlled.

The patient is next required to bend the body forward until the chest and head are received upon their appropriate supports; she then voluntarily extends the vertebral column, which position is maintained

by the long girth seen passing across the loins. In this way she is deprived of all power to raise the body from its support, or otherwise to make any effective resistance. Relaxation of the abdominal muscles and gravitation forward of the pelvic and abdominal viscera are thus permanently secured.

In this position the chest and head suffer no restraint. Respiration and circulation go on smoothly. In short, the entire body is easy and comfortable, and the patient can remain for hours with as little fatigue as upon the back. Anæsthetics can be given with as much safety in this as in any other position ; and I am induced to believe, from our experience so far, that it is even better on some accounts. In vomiting, for instance, no ingesta are liable to reach the larynx, and consequently no delay is experienced in the operation from apprehended strangulation, as very often happens. The face being downward, every thing from the stomach is freely ejected, and the effort does not in the least interfere with the progress of the operation. I have now given ether and chloroform about thirty times in this position, without a single untoward occurrence, and from our convictions based upon this experience I have no hesitation in recommending it as entirely safe, with the observance of ordinary precautions.

When the patient is disengaged from the apparatus, it is doubled up, the hinge-joint C being placed near its middle for the purpose. The head-support, attached by two hinges and held in position by a brace, drops down as soon as the latter is removed, and is placed beneath the chest-support, to which it is fastened. The two supports are thereby made to stand back to back, occupying the least possible space. When thus folded up and set upon the floor, the apparatus resembles somewhat an ordinary chair.

As showing the high estimate that we place upon the many advantages of this simply-constructed apparatus, I would observe that I do not believe a patient can be found, I care not what her size, strength, or temperament may be, who cannot be effectually secured with it without the aid of assistants.

THE SPECULUM.

In this connection we would call attention to certain alterations and improvements which we have made in our *spring and self-retaining speculum* since the first description of it was published in the *New York Medical Record*, nearly a year ago. During the period of these improvements we have continued to use the instrument with the above supporting apparatus, and in every instance it has given entire satisfaction. In fact, we have had no occasion, since its adoption, to use any other form of speculum for examinations or operations about the cervix uteri. The main part of it has required but little change or alteration since its first application. The attachment, however, intended for the elevation and support of the posterior wall of the vagina, has been variously modified. The standing arch first used and described was soon discarded, for the reason that it could be employed only in a certain class of cases. Side springs were then substituted, which proved quite effective, though their management was somewhat difficult in inexperienced hands. In order to overcome this trouble, we attached to each of these springs a spatula-shaped depressor, about four inches in length, intended to elevate the springs and to support in a longitudinal direction the posterior wall of the vagina. This was effected by seizing the outer end of each depressor and pushing

up the spring to its proper place, which being done, this end of the depressor was next slid outward beneath the perineum to its place of support upon the corresponding projecting arch, as is here shown in our medium-sized speculum. This arrangement we found admirably adapted to the purpose above named in the position upon the back, as well as that upon the knees and chest. With the patient in either of these positions we have been able to do with the instrument, thus completed, any thing in the way of examinations and operations without the aid of an assistant. Many have objected to these depressors, under the belief that they complicate the instrument. We have, therefore, made an effort to simplify the working of this part of the instrument still further, which we think we have done in the substitution of one broad depressor for the two heretofore employed in connection with the side springs, which are now dispensed with. This depressor is entirely separate from the main part of the instrument; it is about four inches in length, one in width toward its point, and one and a quarter at its outer end, where there is a short neck or handle, an inch and a half in length, turning upward at an obtuse angle. It is thin and slightly flexible, and is bent to suit the curves of the posterior wall of the vagina, to which it is firmly applied from the perineum to the posterior *cum de sac*. To the under surface of it, near the outer end, is attached along the centre a small triangular plate, the base presenting backward and the apex forward, with a flange on the side edges. These grooves or flanges are intended to guide the depressor to its proper place when received upon the projecting arches of the speculum previously introduced into the vagina and expanded. The arrangement is such that

the depressor can be slid in upon the projecting arches at any stage of expansion, and in that relationship is securely held by the resistance of the perineum and the recto-vaginal wall.



FIG. 2

The illustrative cut Fig. 2 is a one-third size, and a three-quarter view of our medium-sized speculum. The instrument is represented partially expanded. The dotted lines in front and between the expanded or flaring blades are intended to show the shape and position of our last improvement of the attachment for supporting the posterior wall of the vagina. The relationship of it to the projecting arches of the main instrument is very clearly shown. The accompanying edge view of the same represents very well the curves described and the peculiar mechanism of the triangular plate on the under surface of it.

The main part of the instrument, having already been minutely described, may be passed over here. Before leaving the subject, however, we will briefly sum up the principal peculiarities of the instrument for which we claim originality, to wit:

1. The system of leverage employed, which gives us increased power over increased resistance.
2. Transverse dilatation with uniformly varying movement of the blades, which gives us a thin and favorable form of the points for introduction, and a reversal of the size of the two ends of the instrument when expanded within the vagina. By virtue of this *flaring expansion of the blades within the ascending rami of the ischia*, the instrument is made *self-retaining*, which distinguishes it from all others of this class previously constructed.
3. The *elasticity of flexure* belonging to the working-point of the instrument, which gives it an easy adaptation to the soft parts, both in the vagina and at its mouth. This is also a feature of the instrument that particularly distinguishes it from other valved specula, heretofore in use.
4. The applicability of it in all positions, and the advantages secured to the physician or surgeon, of making all examinations, or of doing all operations required upon the vaginal walls and cervix uteri without the aid of assistants.

The arrangement and working of this last improvement can be fully understood by an examination of the whole instrument, which I here present. As now completed, it is, I think, as simple and effective as it is possible to make it. Whether it will ever be adopted in general practice, or not, is a matter of no moment to the obstetric surgeon. As an instrument perfect in its adaptation to all operations upon the anterior wall of the vagina and the cervix uteri, without the aid of an assistant, we think it must sooner or later hold the first rank.

Since the adoption of our supporting apparatus

and this speculum, we have had six consecutive cases of vesico-vaginal fistule, presenting eight fistulous openings, one a *vesico-uterine*. All of these fistules have been closed at seven operations—one operation less than the actual number of openings. These operations, I may add, have been witnessed by nearly a hundred physicians and surgeons of this and neighboring cities, among whom I may mention Profs. Willard Parker, A. C. Post, Jas. R. Wood, Isaac E. Taylor, Drs. Thos. C. Finnell, Lothar Voss, John O. Stone, R. F. Chabert, of Hoboken, De Witt C. Enos, of Brooklyn, R. B. Bontecou, of Troy, and S. H. Tewksbury, of Portland.

Already, I may here observe, several modifications of this instrument have been made, but as yet we have seen no improvement upon the original. The most important of them is that of my friend, Dr. J. C. Nott,¹ of this city. Although this gentleman does not do me the justice to say his instrument is a modification of ours, it is nevertheless true, for the main feature of it I am entitled to the credit of priority, as any one can see at a glance by comparing the two instruments. The self-retaining principle of his instrument is due entirely to the *flaring expansion of two of his blades within the rami of the ischia*, the main principle upon which our instrument was first constructed. This principle of expansion within the pelvic bones, in order to secure the important desideratum of self-retention in the construction of our speculum, I may be permitted to say, I worked out by a series of experiments, extending through a period of nearly two years. I am therefore warranted in saying, from a careful examination of the records of the profession, that no one, previous to the first published account of our

¹ American Journal of Medical Sciences, October, 1868.

speculum, January, 1868, had ever attempted to construct an instrument upon the same principle; and that, from our experience with it thus far, we believe it to be the only principle upon which any simple and useful self-retaining speculum can ever be constructed.¹

SUTURES.

As to the form of suture used, we would say a word.

While we regard the two improvements just described of very great value, and we think they mark a new era in the history of vesico-vaginal fistule; still the fact must not be lost sight of, that the kind of suture employed is no less important now than it has always been. Although the above stated results show an extraordinary amount of success considering the character of the cases, yet this is not to be attributed alone to the improvements above described. Much of it is due to the suture—the button suture, so called from its peculiar mode of action.

This form of suture we devised and first applied nearly fourteen years ago, and no other suture have we ever had occasion to use, in such cases, to the present moment. It is composed of silver wire, a leaden plate, and perforated shot.

We claim for it:

1. Separate and independent action of the sutures.
2. Perfect coaptation of the edges of the fistule, and power to hold them in a certain relationship during the reparative process.
3. Perfect steadiness and support of the edges of the fistule.

¹ Those who may have ordered our speculum before it was completed, can have the last improvement attached by Messrs. George Tiemann & Co., of this city, with but little additional cost.

4. Protection of the denuded edges of the fistule from the vaginal and uterine discharges, and from the urine, when there happens to be more than one opening, and it is not convenient or desirable to close both at the same sitting.

Here we have all the elements of success happily combined, which accord fully with principles recognized by all surgeons in the treatment of wounds in any of the external parts of the body.



FIG. 3.

A very good idea of this form of suture, and the many advantages claimed for it, may be had from an examination of this model which I have made with a piece of buckskin. The leaden plate or button is two inches long, five-eighths of an inch wide, and grooved on the under surface with such an instrument as Fig. 3 represents, which I have invented, and term the *button-forming forceps*. There are seven perforations along the centre through which the two ends of each of the seven sutures are passed. On the top surface of the button are seen seven perforated shot, compressed upon the doubled ends of each wire. To the under or grooved surface of the button, the edges of the fistule, represented by the sides of the slip in the piece of buckskin, are smoothly and firmly applied, presenting, as may be seen, a line of approximation somewhat curved, though corresponding exactly with the line of holes described. This line, although elevated and depressed at certain points, is as perfect as it is possible

to make it from one angle of the opening to the other. At every point the coaptated edges are seen to be under the most complete control, and the closure on the opposite side is so even and perfect that it would be scarcely possible for a drop of water to enter. I will refer incidentally to the case in which this very button was used:

CASE I.—Mrs. R., aged about forty-one, above medium stature, lost control over her bladder at the birth of her second child, July, 1853. She presented herself a few months ago, with a fistulous opening, involving the root of the urethra, the whole of the trigone, and a part of the *basifond* of the bladder. The enormous chasm admitted three fingers into the bladder, and through it protruded constantly the superior fundus of the organ. A more miserable and wretched condition than this poor woman presented, the imagination can scarcely picture. During her fifteen years of affliction five or six operations were performed, some of them by eminent surgeons, though no permanent relief had been afforded up to the time she came under our care. The first application of this suture apparatus, as you see it here, resulted in a complete closure of the opening on the eighth day. This operation, I believe, was witnessed by one or two gentlemen present.

To show now the relationship of the urethra to the edges of the fistule as approximated in the above case, we have attached a tube to the model between the fifth and sixth sutures, through which is passed an elastic catheter No. 6, just as it was used in the operation.¹ This kind of a catheter I prefer to all others on account of the comfort to the patient and the ease with which it can be kept open without removal, simply by running a wire through it. This same catheter, we would remark, was lodged in the bladder five days, and by an examination it will be seen that not the slightest roughness ensued.

Fig. 5, intended to illustrate a fistule of smaller size than the above represents, nevertheless, a button almost precisely the same shape as the one described. Here only six sutures were required. From this cut

¹ See Fig. 4, on next page.

an excellent idea may be obtained of the adjustment of the sutures previously to passing the button down



FIG. 4.

Fig. 4 is an illustration of the apparatus, only a portion of the catheter being shown.

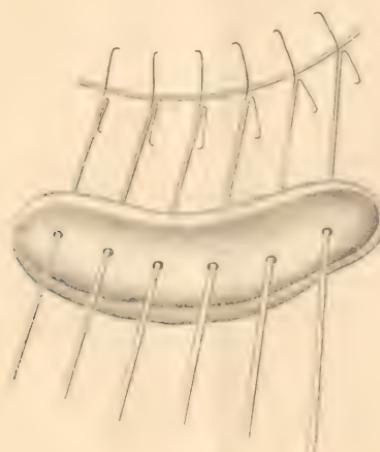


FIG. 5.

upon them, the latter being represented here on the double ends of the wires, sliding down to its proper place.

I will here cite another case, a lady of this city, upon whom we recently operated successfully with this form of suture, which is of unusual interest, from the circumstances attending its history and the result obtained :

CASE II.—Mrs. G.; aged 34; medium stature; well formed; rather stout; nervous temperament; health to all appearances good. While on a visit to Long Branch, September, 1854, was taken in labor, and after five days was delivered, without instruments, of a still-born child, said to have weighed eighteen pounds. A vesico-vaginal fistule was the result—incontinence of urine being discovered almost immediately after the completion of labor. She states that she was not able to leave her bed for several months, owing to a loss of power over the lower extremities.

Returning to this city, she applied to a surgeon for relief, who (January 8, 1855) performed an operation for closure of the fistule, found to be situated just across the root of the urethra, and large enough to admit two fingers into the bladder. The clamp suture of Dr. J. M. Sims was employed, which was attended with only partial success, the failure being at the left angle. Little or no benefit, however, resulted, as regarded the incontinence.

September, 1858, a second operation was performed by the same surgeon, the clamp suture being employed again. A total failure resulted this time from the suture apparatus sloughing out.

December, 1861, the same surgeon performed his third operation, using the clamp suture again. Now union took place in the middle of the fistule, leaving a small opening at each angle. Still the incontinence of urine continued with but little if any abatement.

February, 1868, she was admitted into the New York State Woman's Hospital, and was operated upon there the fourth time by the distinguished surgeon at the head of that institution. Now both of the small fistules above described, as we are informed, were converted into one by a division of the intervening slip of tissue. The opening thus formed was then closed with the interrupted silver suture. The result was a total failure.

In April the same surgeon performed his second (the fifth) operation, using again the interrupted silver suture. Result, a partial closure, though little or no control over the urine was afforded, the incontinence proving to be about as it was after the third operation.

In September the patient was admitted into our private institution. A fistule large enough to admit a No. 6 bougie was found in a mass of cicat-

tricial tissue, situated just above the left angle of the original fistule, far to the left side. October 17th, the parts being found in a suitable condition from our preliminary treatment, we proceeded to close the fistule with our button suture, the patient being placed in the position previously described, and our small-sized speculum introduced. Present, Dr. W. O. Baldwin, President-elect of the American Medical Association, and Drs. Finnell, Nott, Sabine, Carroll, and Morton, of this city.

After cutting out pretty freely the hardened tissues resulting from the repeated operations which had been performed, we found it necessary to introduce only three sutures, which was quickly done, and the whole secured on our button principle. The duration of the operation did not exceed three-quarters of an hour, including the time taken up in explaining the several stages of the operation to the gentlemen present. The patient was kept all the while under the influence of chloroform, which had a most happy effect. As an interesting fact, we will state that this was the fifty-second time that this patient had been anaesthetized.

Nothing unusual occurred in the after-treatment. An elastic catheter No. 6 was kept constantly in the bladder, and the patient required to lie upon her right side. On the eighth day we removed the suture apparatus, and found the fistule entirely closed. After a few days the catheter was discontinued, and the patient then allowed to leave her bed. To her great delight, she now found that she had entire control over her bladder, this power having been lost upward of fourteen years. She was discharged a few days ago, feeling perfectly sound and well.

We would remark here that this lady, an intelligent person, during her long affliction, as might be supposed, watched very closely the results of treatment in her own case, and she indulged a peculiar fancy of collecting the various sutures which from time to time were used upon her, including *clamp suture*, *interrupted silver suture*, and *button suture*. Such a collection of sutures, I venture to say, the misfortunes of but few women have ever supplied. From the interest therefore attached to these relics of scientific progress, the long-suffering of the patient, and the final triumph of art in the case, it cannot be considered out of place here to examine critically these several surgical appliances which have been brought into such close juxtaposition by their application to one and the same *fistulous opening*.

The collection, as seen, we have placed upon a piece of buckskin, so that every part of the respective forms of suture can be examined in its proper relationship. The first surgeon alluded to in connection with the early history of the case performed and has seen performed five of the six operations described, and to him we are indebted for not only a correct and reliable history of the case from the beginning to the end of treatment, but the arrangement in the order of their use of the various forms of suture named, which is as follows:

1. The clamp suture, three applications—unsuccessful.
2. The interrupted silver suture, two applications—unsuccessful.
3. The button suture, one application—cure in eight days.

CLAMP SUTURE.

The *first pair of clamps* is one and five-eighths of an inch in length, and each clamp has four holes in it, corresponding to the four sutures used. In the piece of buckskin I have made a slit one and one-half inches in length, corresponding to the length of the original fistule. To this slit or opening I have applied and secured the same clamps just as they were used in the case. By examination of the model, a most excellent idea can be had of the peculiar mechanism of this form of suture. Although great care here was taken to introduce the sutures on a line equidistant from the edges of the slit, yet there is a want of parallelism in the two clamps. The result of which is, slight inversion near one extremity of the line of approximation, and eversion toward the other, a very common cause of failure in the use of this suture when it was in vogue.

A view of the edges of the slit on the opposite side, supposed to be in the bladder, will satisfy the most casual observer, I dare say, why this form of suture was formerly attended with so little success. The line formed by the coaptated edges, as may be seen, is imperfect, and the latter move freely upon each other. There is, so to speak, a rocking motion of the two edges, and fluid at almost every point can insinuate itself and reach the opposite side.

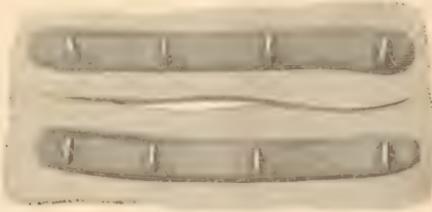


FIG. 6.

Fig. 6 affords a very good idea of this form of suture, and the original size of the fistule.

The *second pair of clamps* employed in the case, as here shown, is one and one-quarter inches long, with which three sutures were used. This operation was a total failure, as may be inferred from the peculiar condition of the clamps, which are seen to be incrusted from one end to the other with earthy matter, a circumstance which very often caused, in this operation, the included tissues, clamps, and sutures all to slough out, leaving an opening two, three, and four times the size of the original fistule.

The *third pair of clamps* employed has been lost, which we regret very much, though, from what we can learn, they were about the same length as the last pair described.

INTERRUPTED SILVER SUTURE.

We come now to speak of the interrupted silver suture employed in the fourth and fifth operations.

The patient was not able, unfortunately, to secure the sutures used in the first of these operations, but she was told that nine were introduced. The number of sutures employed in the second operation was thirteen, seven of which are here shown, the other six having been lost.

We have made in this same piece of buckskin a slit an inch in length, corresponding to the size of the fistule at the last operation, judging from the extent of the cicatrix left. The thirteen sutures, the number then used, we have introduced and secured in the usual way by twisting. The twisted ends of each, half an inch long, are turned down flat, alternately upon the right and left. The introduction and adjustment of these sutures will be recognized by every one as the plan usually followed by experienced surgeons, both as regards the distance of introduction from the edges of the slit and the intervals that usually separate them. It is a principle insisted upon by the advocates of this form of suture to introduce all the sutures as near the edges of the fistule as possible, rarely exceeding the eighth of an inch. In fact, the rule is absolute, and cannot be departed from without endangering the success of the operation by causing inversion. Especially is this the case when the fistule is of considerable size, and the traction is consequently great upon the sutures. The turning of the double ends of the wire down flat upon the tissues on the two sides of the line of approximation is a feeble attempt to counteract this tendency of the edges of the fistule to invert. The wire splint thus formed, it must be admitted, affords some support and steadiness to the coaptated edges; still it cannot prevent their inversion, excepting in small fistules where there is a redundancy of tissue.

We would direct attention now to the approximated edges of this slit on the other side of the piece of buckskin, supposed to be the vesical side of the septum. Here they are seen to gape from one angle to the other, and every suture can be counted at the bottom of the triangular furrow formed. Inversion of the edges exists throughout, notwithstanding the extreme nearness to them at which the sutures are introduced on the opposite side, where closure is as firm and complete as it is possible to make it. The effect of this inverted condition of the edges is that very little over half of the thickness of the buckskin or septum is in contact; the balance of the two surfaces thus separated is exposed, as in the bladder, to the poisonous action of the urine. Those who have had experience in such matters need not be told how uncertain any operation must be with the edges of the fistule brought together in such a relationship.

The crowding of the sutures in, as we have shown, to prevent inversion, and to secure some steadiness and support to the included tissues, is a practice also very often fraught with great mischief, as adopted in large fistules when the traction is necessarily great. The circulation under such circumstances is liable to be interrupted, and the vitality of the included tissues destroyed, resulting very often in a slough and loss of tissue, which may seriously jeopardize the success of a subsequent operation.

BUTTON SUTURE.

Let us next examine the button suture. Here is to be seen a leaden plate, about one-twentieth of an inch in thickness, one inch in length, something over half an inch in width, formed as before described, and along the centre three perforations or holes, a quarter of an

inch apart. The three sutures and the perforated shot used with it are placed by its side in the collection. The whole of the apparatus is here shown just as it was removed from the seat of the fistule in Case II, on the eighth day of the operation.



FIG. 7.



FIG. 8.

Fig. 7 shows the interrupted suture, the number employed in the case, and the peculiar mode of adjusting them, to secure the advantages of a wire splint.

Fig. 8 is intended to show the button suture as it was applied in the case.

Now we have made a third slit in this same piece of buckskin, which is precisely the same length as the one used to illustrate the application of the thirteen interrupted silver sutures. Here we have introduced three sutures only, at a distance of upward of a quarter of an inch from the cut surfaces or edges, about a quarter of an inch apart, and have secured them with just such a button and perforated shot as above described. The coaptation of the edges, as shown, is smooth and perfect throughout, notwithstanding there are but three sutures used, ten less than of the interrupted silver suture. On the opposite side, supposed to be in the bladder, the seat of the operation can scarcely be made out. Considerable force upon the parts is even required to indicate the line at a single point formed by the coaptated edges, and as to motion of the tissues included within the loops of the sutures there is none. Perfect coaptation, steadiness, support, and protection are afforded at all points. The edges here, instead of being inverted, as shown in the application of the interrupted silver suture, are turned away from the

bladder, as indicated on this side of the septum, by a depression at the seat of operation. In this position and relationship they are maintained throughout the reparative process.

The difference between the principle and mechanism of the button and interrupted silver sutures may be briefly summed up as follows:

BUTTON SUTURE.

1. Large wire, No. 26.
2. Three to five sutures to the inch.
3. Sutures introduced from a quarter to half an inch from the edges of the fistule.
4. Sutures secured with a leaden plate and perforated shot.
5. Sutures not exposed in the bladder.
6. Edges of the fistule turned out, and controlled in that relationship.
7. Perfect steadiness and support of the approximated edges of the fistule.
8. Protection of the denuded edges of the fistule from irritating discharges.
9. The apparatus easily and quickly removed.
10. Operation as certain in large fistules as in small ones.

INTERRUPTED SILVER SUTURE.

1. Small wire, Nos. 28 and 29.
2. Five to twelve sutures to the inch.
3. Sutures introduced from a sixteenth to an eighth of an inch from the edges of the fistule.
4. Sutures secured by twisting and turning their ends down flat to form a wire splint.
5. Sutures all exposed in the bladder by gaping of the edges of the fistule.
6. Edges of the fistule turned in, and not controlled.
7. Little or no steadiness of the approximated edges of the fistule.
8. No protection of the denuded edges of the fistule.
9. The sutures troublesome and tedious to remove.
10. Operation has but little certainty in large fistules, success depending on frequent repetitions.

These are the essential differences in the above two forms of suture which, in general practice, have been repeatedly demonstrated and proven, not only in the same class of cases, but upon the same fistulous openings—the most practical and conclusive test to which any operative procedure could possibly be subjected, as all must admit. And the result of no operation, under whatever circumstances performed, can be so well seen and noted as that of vesico-vaginal fistule.

In this manner were proven, some years ago, the many faults of the old clamp suture which we have here described. One of several cases, in which both this and the button suture were successively applied, we will mention. In this case, during a protracted course of treatment of three or four years, the former suture was applied by Dr. Sims himself twelve or fifteen times without success.¹ With the button suture, the two fistules that remained were closed each in eight days with the result of a perfect cure, and we have not the slightest doubt, from our somewhat extensive experience since, that in the second case here cited the same result could have been secured in the outset of the treatment by the latter form of suture.

The ultimate and complete success with this suture in the case may be attributed by some to advantages gained by previous operations in diminishing the size of the fistule, but such an explanation is without foundation, and can result only from a want of experience or familiarity with the principle of the operation. According to the facts stated, at the time of the fifth and sixth, the last two operations, the fistule was about the same size, but how different were the results!

The final operation, we are warranted in saying, would have been easier and just as certain had the fistule been of its original size and condition, admitting readily as it did two fingers into the bladder. As we found it, there was an obstacle to contend with not present at the beginning of the treatment, which now seriously militated against success, namely, cicatricial hardening of the tissues from repeated operations. This feature of the case is of importance, and should not be lost sight of in the estimate of the final result.

As to the size of any fistule, provided the edges are movable, it is a matter of no consideration—the operation with this form of suture being just as certain when large as when small. Case I. affords the strongest proof of the fact. Here the fistulous opening was large enough to admit three fingers, instead of two, as in Case II., and yet in the former case the operation requiring seven sutures was just as successful and satisfactory as in the latter, where only three sutures were called for. This, we may add, is an important and distinguishing peculiarity of this button suture, and explains why the percentage of successful operations in a given number of cases does and will exceed that of all other known methods.

In speaking here of the results of these practical tests in the same cases, we wish it understood that no disparagement is meant to the skill of the several surgeons who preceded us. The entire competency of all of them to secure the greatest amount of attainable success with their favorite forms of suture is admitted, and we cheerfully accord to them as much judgment in the operation as we have, or any other surgeon or surgeons. The difference in the results of practice shown is to be found in the methods of operating, not in the superior skill of one surgeon over another.

The mode adopted of presenting the subject is intended to get at facts, and facts only, regarding the respective merits of the several forms of suture described. We think the importance of the subject warrants it, and, if there is a difference in the results and practice favorable to one or the other, the profession should know it.

What we wish is a fair and honest report of cases and results of operations of whatever form of suture

adopted. Facts will speak for themselves, and, when well authenticated, even one, to the practical mind, is worth a thousand opinions or assertions of any one, it matters not who he may be, or what are his opportunities and advantages.

